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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/065,495

10/24/2002

Ronald Scott Bunker

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04/06/2004

NIXON & VANDERHYE P.C./G.E.  
1100 N. GLEBE RD.  
SUITE 800  
ARLINGTON, VA 22201

EXAMINER

RODRIGUEZ, WILLIAM H

ART UNIT

PAPER NUMBER

3746

DATE MAILED: 04/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/065,495

Applicant(s)

BUNKER, RONALD SCOTT

Examiner

William H. Rodriguez

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 7/24/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Specification***

1. The specification is objected to because reference characters "45" and "46" have both been used to designate "a combustor liner" in lines 12 and 15 of page 5. Appropriate correction is required.

In page 6 line 1 of the specification, the element "sleeve 62" should be "sleeve 64" as disclosed in Figure 6. Appropriate correction is required.

In page 6 line 3 of the specification, the element "concavities 64" should be "concavities 62" as disclosed in Figure 6. Appropriate correction is required.

In page 6 line 4 of the specification, the element "sleeve 62" should be "sleeve 64" as disclosed in Figure 6. Appropriate correction is required.

### ***Claim Objections***

2. Claim 9 recites the limitation "first plurality" in line 2. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 4-6 and 10-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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It is not clear from the claim if the diameter, depth and spacing between adjacent grooves are measured in inches, centimeters or something else. Examiner suggests placing the unit in which these dimensions are measured (i.e., inch, cm, etc). Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

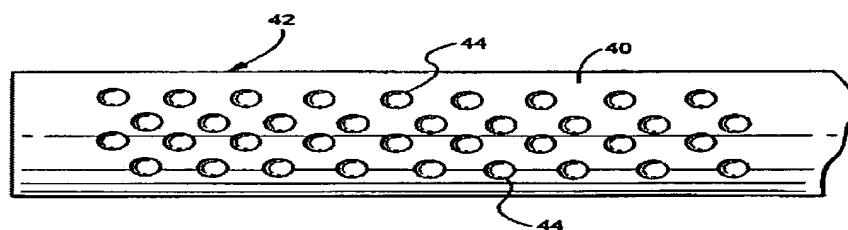
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-3 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by **Prior Art**

**Figure 3** (disclosed by applicant).



***Fig. 3 (Prior Art)***

With respect to claim 1, prior art **Figure 3** shows a combustor liner for a gas turbine, the combustor liner having a substantially cylindrical shape; and a plurality of axially spaced

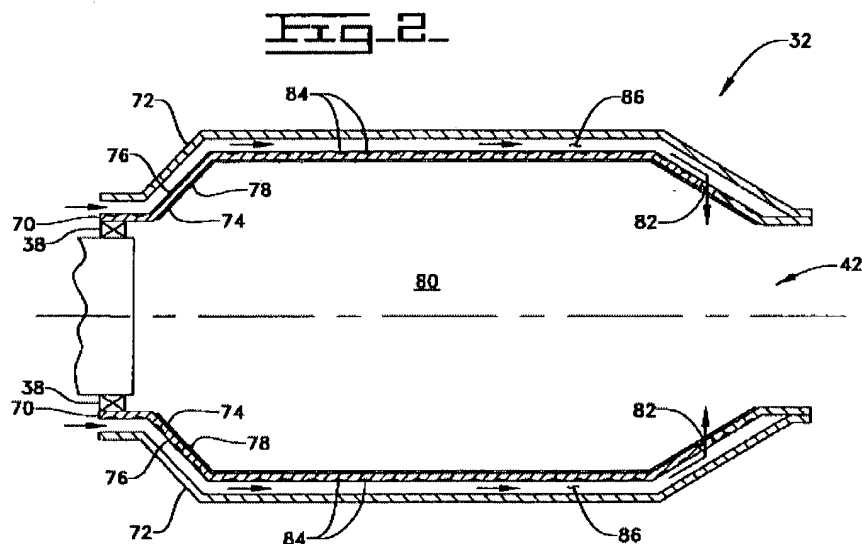
circumferential grooves 44 formed in an outside surface of said combustor liner. See prior art Figure 3 above.

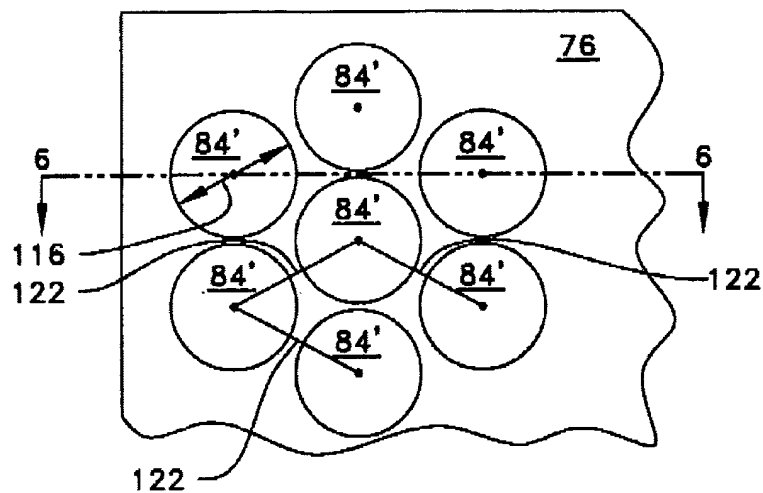
With respect to claim 2, prior art **Figure 3** shows that said grooves 44 are substantially semi- circular in cross-section. See prior art Figure 3 above.

With respect to claim 3, prior art **Figure 3** shows that said grooves 44 are arranged transversely to a direction of cooling air flow. See prior art Figure 3 above.

With respect to claim 8, prior art **Figure 3** shows that said grooves are 44 angled relative to a direction of cooling air (about 90 degrees angle). See prior art Figure 3 above.

7. Claims 1-3 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by **Glezer et al.** (U.S. 6,098,397).





**FIG-5.**

With respect to claim 1, **Glezer et al.** teach a combustor liner 70 for a gas turbine, the combustor liner having a substantially cylindrical shape; and a plurality of axially spaced circumferential grooves 84 formed in an outside surface of said combustor liner. See particularly **Figures 2, 5** of Glezer et al.

With respect to claim 2, **Glezer et al.** teach that said grooves 84 are substantially semi-circular in cross-section. See particularly **Figures 2, 5** of Glezer et al.

With respect to claim 3, **Glezer et al.** teach that said grooves 84 are arranged transversely to a direction of cooling air flow. See particularly **Figures 2, 5** of Glezer et al.

With respect to claim 8, **Glezer et al.** teach that said grooves are 84 angled relative to a direction of cooling air (about 90 degrees angle). See particularly **Figures 2, 5** of Glezer et al.

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8. Claims 1, 8 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by **Hadder** (U.S. 6,530,225).

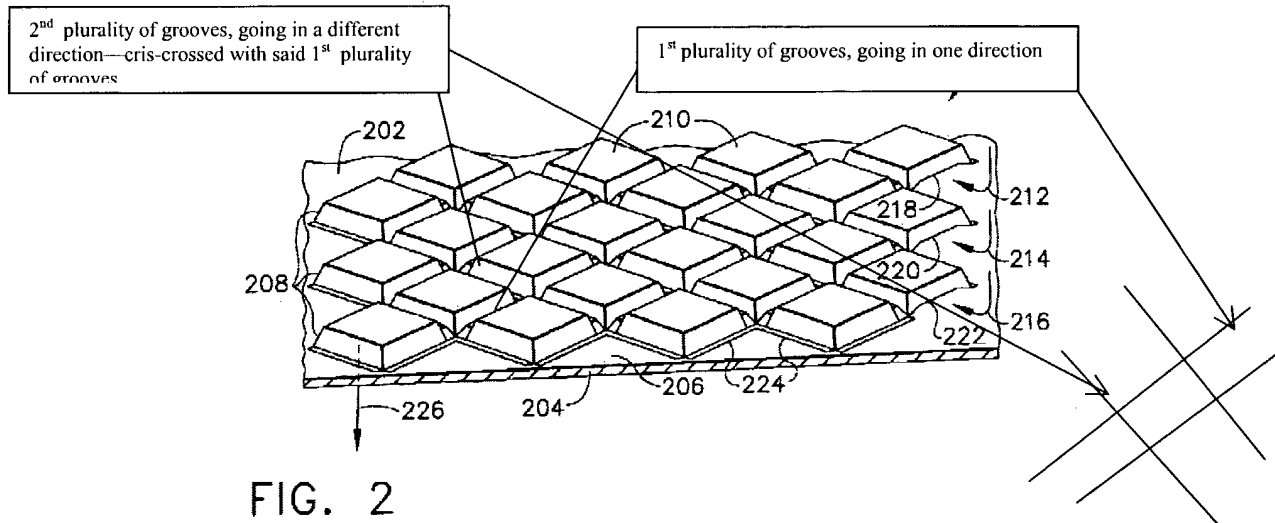


FIG. 2

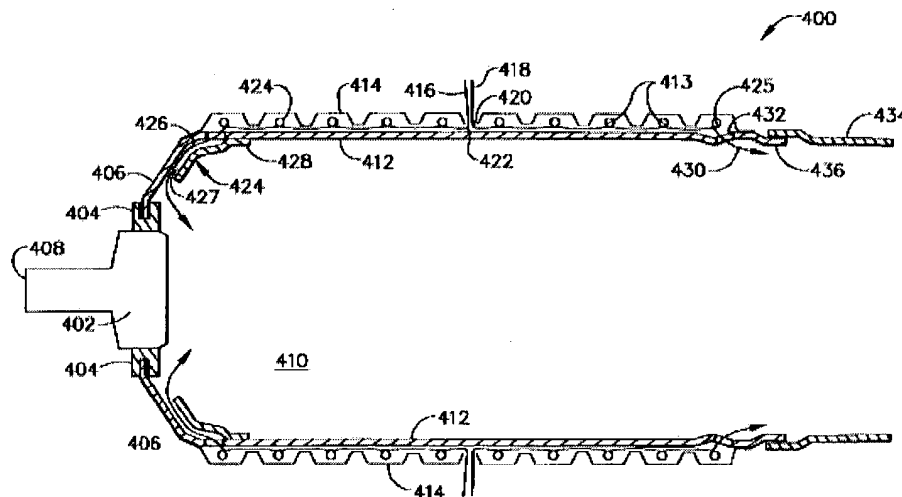


FIG. 4

**Hadder** teaches a combustor liner for a gas turbine, the combustor liner having a substantially cylindrical shape; and a first plurality of axially spaced circumferential grooves (space between protrusions) formed in an outside surface of said combustor liner, wherein said

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grooves are angled relative to a direction of cooling air (about 90 degrees angle); and a second plurality of circumferential grooves criss-crossed with said first plurality of circumferential grooves. See particularly **Figures 2, 4** of Hadder.

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 4-6 and 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Glezer et al. (U.S. 6,098,397)**.

With respect to claims 4-6, **Glezer et al.** teaches that said grooves have a diameter, a depth and spacing between adjacent grooves. However, these dimensions do not fall between the ranges claimed in the instant application. Nevertheless, selecting a different diameter, depth and spacing between adjacent grooves is a design choice within the level of one of ordinary skill in the art. This selection could have been based on design constraints such as but not limited to: combustor weight (removal of more material, a lighter combustor), quantity of turbulence required to enhance or increase cooling, etc. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected different dimensions for the diameter, depth and spacing of Glezer's grooves in order to satisfy certain specific design constraints. See particularly column 4 line 45 to column 5 line 14 of Glezer et al.



With respect to claims 10, 11, 13, **Glezer et al.** teach a combustor liner 70 for a gas turbine, the combustor liner having a substantially cylindrical shape; and a plurality of axially spaced circumferential grooves 84 formed in an outside surface of said combustor liner, wherein said grooves 84 are substantially semi- circular in cross-section. **Glezer et al.** teaches that said grooves have a diameter, a depth and spacing between adjacent grooves. However, these dimensions do not fall between the ranges claimed in the instant application. Nevertheless, selecting a different diameter, depth and spacing between adjacent grooves is a design choice within the level of one of ordinary skill in the art. This selection could have been based on design constraints such as but no limited to: combustor weight (removal of more material, a lighter combustor), quantity of turbulence required to enhance or increase cooling, etc. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected different dimensions for the diameter, depth and spacing of Glezer's grooves in order to satisfy certain specific design constraints. See particularly column 4 line 45 to column 5 line 14 of Glezer et al.

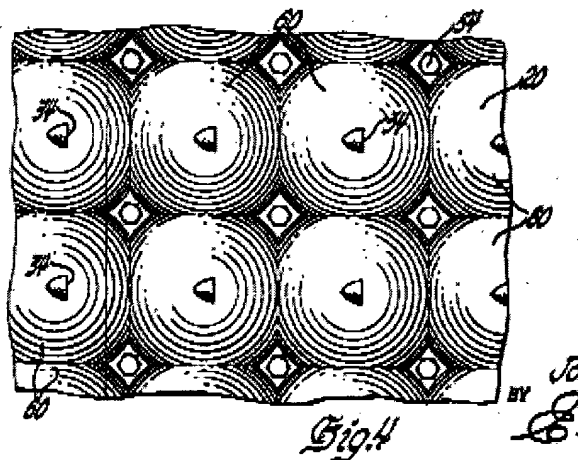
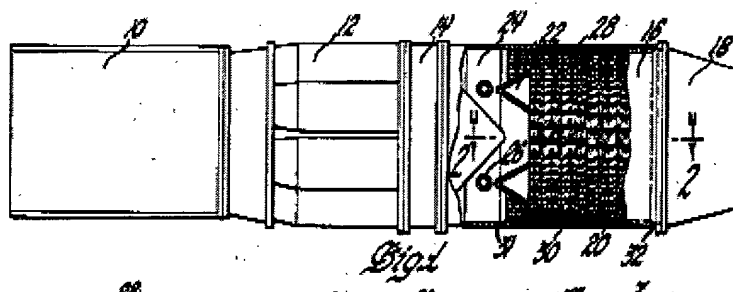
With respect to claim 12, **Glezer et al.** teach that said grooves 84 are substantially semi-circular in cross-section. See particularly **Figures 2, 5** of Glezer et al.

With respect to claim 14, **Glezer et al.** teach that said grooves 84 are arranged transversely to a direction of cooling air flow. See particularly **Figures 2, 5** of Glezer et al.

With respect to claim 15, **Glezer et al.** teach that said grooves are 84 angled relative to a direction of cooling air (about 90 degrees angle). See particularly **Figures 2, 5** of Glezer et al.

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11. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Wetzler** (U.S. 2,938,333) in view of **Glezer et al.** (U.S. 6,098,397).



With respect to claim 1, **Wetzler** teach a combustor liner 20 for a gas turbine, the combustor liner having a substantially cylindrical shape; and a plurality of axially spaced circumferential cup-like protruding elements 60 formed in an outside surface of said combustor liner 20. **Wetzler** does not teach a plurality of axially spaced circumferential grooves formed in an outside surface of said combustor liner but a plurality of cup-like protruding elements 60. However, **Glezer et al.** teach a combustor liner 70 similar to **Wetzler**'s liner 20 having a plurality of axially spaced circumferential concavities or grooves 84 formed in an outside surface of said combustor liner 70. Further, **Glezer et al.** teach that said concavities-grooves 84 increase

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convective cooling without greatly increasing pressure losses as in the case of protruding elements. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used Glezer's teachings and provide a plurality of concavities 84 instead of protruding elements 60 to Wetzler's liner so as to increase convective cooling without increasing pressure losses. See **Figures 1,4** of Wetzler; and **Figures 2,5** and column 5 lines 12-14 of Glezer et al.

With respect to claim 2, **Wetzler** in view of **Glezer et al.** teach that said grooves 60 are substantially semi-circular in cross-section. See **Figures 1,4** of Wetzler; and **Figures 2,5** of Glezer et al.

With respect to claim 3, **Wetzler** in view of **Glezer et al.** teach that said grooves 60 are arranged transversely to a direction of cooling air flow. See **Figures 1,4** of Wetzler; and **Figures 2,5** of Glezer et al.

With respect to claims 4-6, **Wetzler** in view of **Glezer et al.** teaches that said grooves have a diameter, a depth and spacing between adjacent grooves. However, these dimensions do not fall between the ranges claimed in the instant application. Nevertheless, selecting a different diameter, depth and spacing between adjacent grooves is a design choice within the level of one of ordinary skill in the art. This selection could have been based on design constraints such as but no limited to: combustor weight (removal of more material, a lighter combustor), quantity of turbulence required to enhance or increase cooling, etc. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected different dimensions for the diameter, depth and spacing of Wetzler-Glezer's grooves in order to satisfy

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certain specific design constraints. See particularly column 4 line 45 to column 5 line 14 of Glezer et al.

With respect to claim 7, **Wetzler** in view of **Glezer et al.** teach that said grooves 60 are each comprised of overlapping circular concavities. See particularly **Figure 4** of Wetzler.

With respect to claim 8, **Wetzler** in view of **Glezer et al.** teach that said grooves are 84 angled relative to a direction of cooling air (about 90 degrees angle). See **Figures 1,4** of Wetzler; and **Figures 2,5** of Glezer et al.

### ***Contact information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William H. Rodriguez whose telephone number is 703-605-1140. The examiner can normally be reached on Monday-Friday 7:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Justine R Yu can be reached on 703-308-2675. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

W.R

  
**JUSTINE R. YU**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 3700**

4/2/04